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STANDARDS FOR FLAVORING EXTRACTS.

By Wilbur L. Scoville.

There are standards and standards. Some are positive and definite, more are variable. Our title is one of the latter class.

To the man who "lives to eat," a standard in flavoring extracts is one thing; to the man who "eats to live," it is quite another. The first calls himself an epicure, and prides himself on a capability for fine discrimination in taste and an appreciation of the more subtile effects in palate-tickling. The other has his attention occupied by other things, and asks only that his food shall be acceptable to an unabused palate.

Like most standards, this is a matter of education. The epicure is simply one who has enjoyed the finest opportunities of culinary art, and by attention thereto has learned to appreciate them. He frequently gets to the point where he would rather invent "a new dish" than be President. The non-epicure may have lacked either the opportunity or the needed attention to train his palate to a fine discrimination, and there are many grades of him. Attention plays a more important part than opportunity in all phases of education.

Then the harmonies of life enter into the question. Man is instinctively harmonious in his habits—in eating, in dress, in recreations, in all his tastes. Harmony more than quality determines the enjoyment of the table. A course of poorly seasoned or highly seasoned meats and vegetables is not in accord with a delicately flavored pudding, however fine the flavor may be. Cooks are rarely artists, and if the seasoning of the soups, meats and vegetables does not match that of the pastry, the latter, following, may appear flat

or coarse, as the case may be. So the softness of the pastry-flavor is largely determined by the seasoning and quality of the more substantial foods.

This is, perhaps, the reason why a true vanilla flavor is so little appreciated. It follows after the coarser cuts of meat, or a habit of high seasoning, and the delicacy is mistaken for flatness or weakness of flavor. It is not to be wondered at that the heavier tonka is needed in part to make a satisfactory impression on the gustatory nerves. The flavors must match. So the expert who declares that only a high-grade vanilla-bean extract is the standard for a vanilla flavor, is speaking only for the most fortunate or attentive classes of eaters, and the great bulk of the public, with their unfortunate culinary restrictions, is ignored.

Tonka is wholesome; why should it be interdicted? It is purely an individual question, and the individual has rights. To say that tonka is not vanilla and should not be called by that name is quibbling. The public knows that particular character of flavor by that name, and is well aware that the quality varies. Just how and why it varies the public cares little so long as its diversified palate is satisfied and the extract is wholesome.

And for the synthetic bodies now so rapidly increasing in use—if the public finds that the distinction between vanilla and vanillin is too subtile for the average discrimination, and that vanillin holds its flavor better in cooking, why should the epicure object to the non-epicure enjoying it? And if it wishes a heavier flavor, made by the combination with cumarin, is this objectionable to others?

Taste is self-regulative. There is no danger of its going too far toward coarseness. No law is needed to prevent the use of rotten eggs in cooking, and in the absence of unwholesome or injurious ingredients, no law is needed to regulate the standards of flavors. At the present time there is no evidence to show that any deleterious substances are being employed in these. Vanilla extracts, for instance, are made from vanilla beans of various grades, from the most delicate Mexican bean to the "pure" but coarse Tahiti beans or the rank "Vanillons." They are combined or not, according to demands, with tonka, vanillin or cumarin to suit the wants of buyers.

There is a great difference in delicacy of flavor between a fine Mexican vanilla bean, a Bourbon, a Tahiti and a Vanillon bean. The last two are strong and rank, and combinations of the better

vanillas with tonka or cumarin are often preferable to a "pure" extract of a rank vanilla bean. And to the non-expert a substitution of the synthetic bodies, vanillin and cumarin, will yield a more uniform, and generally quite as satisfactory flavor. In fact, these principles are to be preferred when uniformity in strength and flavor is particularly desired. Thus it is that "Vanilla Extract" is supplied by manufacturers at prices varying from $1 to $30 per gallon, and that agents are instructed to take orders at any desired price.

Beside the diversities in taste, there are considerations of use that must be regarded. Flavoring extracts are largely employed in beverages, ice-creams, confectionery, etc., as well as in cooking. Each use demands particular qualities in its extracts. Beverages and ice-creams, as a rule, require higher qualities of flavor than for other purposes, partly because the sense of taste is more acute on chilled substances than on warm, and partly because the flavors, not being cooked, remain unchanged or undiminished by heat. But they also need to be soluble in, or miscible with water, in order to make the beverages or cream presentable to the eye as well as to the palate. Probably the most difficult problem the manufacturer has to meet is the supplying of nice but "soluble" extracts. Vanilla offers no difficulties in regard to solubility, but a white extract is often desired, for the suggestion that the eye makes to the palate is important.

As soon as the particular desire of the buyer is understood, the problem of supply is easy. Is his purpose epicurean? give him an extract of best Mexican beans. Is he prejudiced for a "pure" vanilla, but wants it "strong?" make his extract from Tahiti beans with, perhaps, a trace of Vanillons. Does he prefer tonka, or are his prejudices only partial? give a mixture of vanilla and tonka. Or is he seeking only a satisfactory flavor, and wishes it at as low cost as possible? a combination of vanillin and cumarin is likely to please.

Lemon extracts are more difficult of adjustment, because the available flavors of this class are more restricted, and the problem of making them soluble and at the same time preserving a good quality, is greater.

They differ mainly in the quality and character of the oils from which they are made. The nicest are made by direct extraction from the fruit, or from selected oil, with addition of some of the lemon-peel. But the oil is extremely variable in quality and purity

and is not easily miscible with other substances. The "soluble" extracts are now made from the so-called "concentrated" or "soluble" or "terpeneless" oils of lemon, which vary widely in all their qualities, and need to be toned with lemon-peel, unless of the best grade. Citral, the chief but not sole flavoring principle of the oil, is employed largely, but mainly in the cheaper grades, because its coarseness is not easily covered. The cheaper extracts are further toned with the heavy oils of lemon-grass or of limes, strong both in flavor and odor. Unless lemon-peel is used, the extract must be colored. The possible combinations are legion, and none of these bodies are injurious in the quantities in which they are employed, with the possible exception of the coloring matters, and here the danger is remote.

Orange extracts correspond to lemon in composition and qualities, and are quite as inconstant. Other flavors, being less used, are in diminished variety, but similar opportunities for modifications exist, and are utilized according to demands.

Formulas are scarcely necessary, at least to one moderately familiar with what is being employed as ingredients of the various flavors. Formulas designated as "standard" may, in fact, be misleading or detrimental to the man in business. Does the pharmacist or manufacturer wish to build up a business in flavoring extracts? If he seeks the trade of the large user he must become acquainted with the desires and ideas of the buyer. If he aims to supply the kitchens, let him go to the meat markets and provision dealers of his prospective customers and learn what cuts of meat are most in demand, and what qualities of vegetables and spices are preferred. He will find this information far more reliable as a cue to his customers' desires than the opinion of the expert as to what is "best." If he can harmonize his extracts with the rest of the table, his extracts will satisfy.

The only standard that can be legally applied to flavoring extracts is that of wholesomeness. The delicacy, the correctness of the flavor, and the other qualifications must remain with the desires of the individual.

Who is to say that the poor man, obliged to content himself with cheap foods unskilfully prepared, crudely seasoned and ungarnished, must use only the more delicate and true flavors or go without any? Or, on the other hand, that the epicure must vex his cultivated palate with a heavy flavor because, forsooth, it is "standard?"

One has only to look back a few years and note how the demand for the rank ether-composed fruit-flavors has almost disappeared to see that the popular standard for flavors is and must be a variable one, and can be relied upon to regulate itself in accordance with the progress of art and science in improving upon the old and the better opportunities for better foods and cooking in general.

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SOME NOTES ON ESSENTIAL OILS.

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Among the various substances official in our national pharmacopœia, few have attracted more attention, as a class particularly, than have the essential oils. Volumes have been written on the subject, and years of patient work and study on the part of a small army of investigators have been spent in studying the physical properties and determining the chemical composition of the different compounds usually classed under this head.

From the point of view of the practical pharmacist, essential oils are of interest in that with them, more than with any other class of compounds, he is largely if not entirely at the mercy of the dealer or manufacturer.

It is true that the pharmacopœia gives descriptions of the physical properties, and usually also chemical tests, for the identification of the different oils, but even then it is quite possible for almost any one of these oils to conform to a number of the pharmacopœial requirements and still be adulterated or debased to a very considerable degree.

To be positive of the genuineness or purity of almost any one of the essential oils, it would be necessary that the pharmacist be a specialist in this particular branch of chemistry, and have at his command intricate and expensive pieces of apparatus for determining the specific gravity, boiling-point, congealing-point, optical rotation and refraction of an oil, to say nothing of fractional distillation or the chemical determination of the different constituents by means of saponification, esterification, acetylization or any one of the other procedures that have been devised for separating, or recognizing the nature of, the various compounds of which the essential oils are composed.

The following table of specific gravities, taken from the different authoritative works mentioned in the first column, will give a very fair idea of the differences of opinion that exist on this one and most important physical property.

TABLE GIVING VARIATION IN SPECIFIC GRAVITY OF DIFFERENT ESSENTIAL OILS, AT 15° CENTIGRADE UNLESS OTHERWISE NOTED.

Oil of	United States Pharmacopœia.	British Pharmacopœia.	German Pharmacopœia.	Limits of Universal Pharmacopœia.	Gildemeister and Hoffmann.
Bitter Almonds .	1·060–1·070			1·043–1 070	1·052–1·096
Cinnamon[1]	1·055–1·065	1·025–1·035	1·055–1·070	1·025–1·070	1·050–1·070
Cloves[2]	1·060–1·067	Not below 1·050	1·072–1·074	1·030–1·074	1·045–1·070
Eucalyptus	0·915–0·925	0·910–0·930		0 900–0·930	0·910–0·930
Juniper Berries .	0·850–0·890	0·865–0·890	0·865–8·880	0·840–0·911	0·865–0·882
Lavender	0·885–0·897	Not below 0·885	0·885–0·895	0·870–0·948	0·885–0·895
Mustard	1·018–1·029	1·018–1·030	1·018–1·025	1·010–1·030	1·016–1·022
Peppermint . . .	0·900–0 920	0·900–0·920	0·900–0·910	0·840–0 975	0·895–0·926
Rose[3]	0·865–0·880	0·856–0·860		0·830–0·954	0·855–0·870
Rosemary	0·895–0·915	0·900–0·915	Not under ·900	0·880–0·915	0·904–0·913
Sandalwood . . .	0·970–0·978	0·975–0·980	0·975–0·985	0·960–0·990	0·975–0·980
Wintergreen . .	1·175–1·185			1·175–1·188	1·180–1·187

[1] British Pharmacopœia specifies Ceylon cinnamon.
[2] German Pharmacopœia recognizes only eugenol.
[3] This is at 20° centigrade, with the exception of the British Pharmacopœia, which specifies 30°.

A careful study of the above table will convince almost any one that there is still much to be learned, or definitely determined, in connection with these interesting compounds. It must be remembered, too, that this is but one of a number of points on which there is a decided difference of opinion. But what is stranger still is the fact that this difference of opinion is justified by the difference in composition of the same oil coming from different localities, or at times even from the same locality, depending on atmospheric conditions or methods of procedure in the production of the oil.

It is also true, however, that a large amount of original work is being done on the essential oils at the present time, and it is probable that in the near future the variations in the physical properties will be thoroughly investigated and the reasons for their variation definitely determined.

It is only necessary to mention the names of Wallach, Tiemann, Beckmann or Gildemeister in Germany; Parry, Holmes or Umney in

England; or Kremers, Kleber or Kebler in our own country, to call to mind a host of valuable contributions on this subject that have already done much toward making the subject of the essential oils one of the most advanced in the realm of organic chemistry.

The semi-annual reports of Schimmel & Co., of Leipzig, Germany, contain a fund of practical as well as theoretical information on the essential oils, and it was a casual perusal of their latest (October–November, 1902) number of this report that prompted the compilation of the following notes and ideas. Much of the information contained in the following pages was culled from this report, and where not otherwise accredited, it may be assumed that any actual information given is from this source.

Before passing to the consideration of the various essential oils in detail, there is one other phase of the question that should be considered. It is well known that, as a direct outcome of original chemical investigation, the chemical constituents of the active, or at least the more important, ingredients of a number of essential oils have been recognized. Some of these constituents have been reproduced synthetically from other products much more economically, and in several cases more uniform in composition, than the natural product.

These synthetic products or imitations promise to play a very important part in future discussions on essential oils. They should not be confounded, however, with the so-called mixtures, blends or compounds with which the market is flooded at the present time. These compounded oils are adulterations pure and simple, and while labeled correctly by the manufacturer or wholesale dealer, are willingly and knowingly sold to deceive.

It may be of interest to introduce here some approximate comparison of the present prices of the synthetic and natural oils:

BITTER ALMONDS.

Oil of bitter almonds, true	65
Oil of bitter almonds, natural	30
Oil of bitter almonds, synthetic	10

CINNAMON.

Oil of cinnamon, cassia ordinary	5
Oil of cinnamon, cassia prime	10
Oil of cinnamon, artificial	40
Oil of cinnamon, Ceylon	150

MUSTARD.

Oil of mustard, essential true	50
Oil of mustard, synthetic	30

ROSE.

Oil of rose, geranium	2 to 10
Oil of rose, artificial	20 to 40
Oil of rose, good	50 to 60
Oil of rose, best	80 to 100

WINTERGREEN.

Oil of wintergreen, true	30
Oil of wintergreen, sweet birch	15
Oil of wintergreen, synthetic	5

These comparative prices, while of themselves interesting, open up the very grave as well as important question of substitution or adulteration. It will readily be appreciated that a synthetic oil of bitter almonds, for instance, that is approximately one-third the price of the so-called natural and only one-sixth the price of the true, may be and often is substituted for one or the other.

This feature will be referred to again under the headings of the different essential oils.

Oil of Bitter Almonds.—Gildemeister and Hoffmann say that but a very small proportion of the so-called natural oil is made from bitter almonds. It is more frequently made from apricot and peach kernels. The amount of hydrocyanic acid in the natural oil, according to the same authorities, may vary from 1·60 to 11·4 per cent. with a corresponding specific gravity of from 1·052 to 1·096.

It would appear from the above quoted authorities that natural or true oil of bitter almonds varies very considerably in physical properties, as well as chemical composition. It would further appear from current literature that it is practically impossible to find an absolutely pure natural oil on the market at the present time.

Edward Kremers, in a review of oil of bitter almond (*Pharm. Rev.*, 1902, page 127), gives some interesting data on the subject, and among other interesting points reports the systematic examination of twenty-six commercial specimens of oil of bitter almonds. Twenty-one of these twenty-six commercial specimens contained chlorine, only nine of the specimens contained any trace of hydrocyanic acid, only four of the nine having more than 2 per cent. The specific gravity varied from 1·0015 to 1·0779, the benzoic acid from 0·91 to 12·02 per cent.

Inquiry among manufacturers' agents elicited the assertion that it was quite feasible to furnish, at a reasonable price, chemically pure benzaldehyde, absolutely free from any trace of chlorine.

In view of the fact that natural oil of bitter almonds contains a variable amount of a very poisonous chemical—hydrocyanic acid—and which, in this country at least, is never taken into consideration when using preparations made from the oil, would it not be in keeping with modern ideas of progress to adopt synthetic oil of bitter almonds, or rather purified benzaldehyde, as oil of bitter almonds in future editions of the United States Pharmacopœia?

If a physician wishes to prescribe hydrocyanic acid he can readily add any desired amount of the official diluted acid, while as a culinary flavor an alcoholic solution of benzaldehyde would certainly be preferable to an essence containing a variable amount of a very active poison. As for pharmacopœial tests, it should be less difficult to describe and give tests for a definite chemical compound of known and fixed composition than for the present variable natural product.

Oil of Cinnamon.—What is sold in commerce as oil of cinnamon varies from a very cheap grade of oil of cassia to the finest oil of Ceylon cinnamon, the latter costing fully thirty times as much as the former. By far the greatest amount of what is sold in the drug trade as oil of cinnamon, is Chinese oil of cassia, the official U.S.P. oil.

The general quality of this oil has been much improved in the last decade, largely due to the fact that it is now generally bought and sold in the wholesale trade at prices based on the actual cinnamic aldehyde content. Schimmel & Co. say that the bulk of the available oil is even at the present time of medium quality, with a cinnamic aldehyde content of from 65 to 75 per cent. Oils having an aldehyde content of from 80 to 85 per cent. are readily obtainable, however, and represent about one-fourth the total exports from China.

The use of oil of Ceylon cinnamon is largely restricted to perfumers and manufacturers of soap. It is official in the British Pharmacopœia, but has no evident advantage over oil of cassia. The latter, on account of the higher amount of cinnamic aldehyde present has, if anything, more value from a medical point of view.

Oil of cinnamon offers the anomalous condition that owing to the present depressed market conditions the artificial product is unable

to compete with the natural oil. According to one manufacturer's statement the cost of production cannot be reduced beyond a certain limit; this is at the present time much beyond the price of a good natural product. The artificial oil does compete, however, to a limited extent, with Ceylon oil of cinnamon, the constant composition, light color and sweet delicate flavor making it if anything superior to the best Chinese oil.

In this connection it would appear feasible to obtain absolute, or nearly absolute, cinnamic aldehyde, and if, as has been asserted, this is the active ingredient of the commercial oil, there could be but little objection to its introduction in medicine.

It might be mentioned here that, owing no doubt to the very low price of oil of cinnamon, or rather oil of cassia, little or no complaint is being made of any wholesale adulteration.

OIL OF CLOVES.—Schimmel & Co. say that the market in this oil must be considered to be in a demoralized condition; only experts could estimate the real value of any of the present oils.

Ten samples of oil of cloves, examined by Schimmel & Co. recently, varied in specific gravity from 1·0287 to 1·066, and in phenol content from 73 to 98·75 per cent.

Gildemeister and Hoffmann give the specific gravity of a true oil of cloves as varying from 1·045 to 1·075, according to the method of preparation. The eugenol content varies from 70 to 85 per cent. According to Kremers (*Phar. Rev.*, 1902, page 499) some manufacturers collect the distillate from cloves in fractions. From these fractions a mixture is made to conform to the desired U.S.P. article for medicinal use. The latter takes but a comparatively unimportant portion of the total oil produced.

Professor Kremers, at the last meeting of the American Pharmaceutical Association, called attention to the wide variation in the specific gravity of an oil of cloves, the total product of distillation. Kremers pointed out that if the U.S.P. intended to include the total product, greater variation in the permissible specific gravity were necessary.

In addition to eugenol, oil of cloves has a number of constituents, among them a small quantity of methyl alcohol, about 3 per cent. of acet eugenol, a sesqui-terpene (caryophyllin), acet salicylic acid, ester of eugenol, methylamylketone, vanillin and furfurol. It is to the latter of these compounds that the gradual darkening of oil of

cloves is usually ascribed. This latter point has not been generally accepted however.

The uses for oil of cloves outside of medicine are varied. Chief among them probably is the use of eugenol as a base for other compounds, vanillin, for instance; and the use of different fractions of the oil in perfumes, or as additions to other odoriferous compounds.

It is well known that the German Pharmacopœia, under oil of cloves, designates the oxygenated portion of oil of cloves or eugenol. This has at least the one advantage of restricting the physical constants of specific gravity, as well as the boiling-point within certain well-defined limits, the former being given as from 1·072 to 1·074, while the latter is from 251 to 253.

In this connection it would appear that the simplest solution of the oil of-cloves problem, so far as the United States Pharmacopœia is concerned, would be to restrict the title to the oxygenated portion, or eugenol, giving appropriate tests for detecting admixtures.

Oil of Eucalyptus.—According to Schimmel & Co. the Algerian distillers have the upper hand in the distillation of the globulous species; they supply a faultless quality at such a low price that the Australian manufacturers have been compelled to withdraw their competition. The Australian oils of Eucalyptus are said to contain appreciable quantities of phellandrene.

Eucalyptol or cineol, which was introduced into the 1890 edition of the United States Pharmacopœia, fully maintains its popularity as an addition to the materia medica. The medicinal virtues of eucalyptol are gradually becoming better known in Europe, particularly as an addition to antiseptic washes or sprays.

With improved methods of separating eucalyptol from the different available oils, it will no doubt be found that any discrepancy in price will gradually disappear. Gildemeister and Hoffmann recount no less than twenty-three Eucalyptus species giving an oil containing cineol or eucalyptol in appreciable quantities.

The oil from Eucalyptus odorata is said to be particularly rich in cineol.

The separation of eucalyptol or cineol is described in a recent number of the *Pharmaceutische Centralhalle*, 1903, page 10. It may be separated from the accompanying compounds by agitating the oil with strong phosphoric acid. A crystalline combination of the cineol separates out; from this combination the cineol may be lib-

erated by simply diluting with water. By concentrating the phosphoric acid again to the proper consistency, it may be used again for the same purpose. Merck & Co. have patented a process which depends on the use of arsenic acid for the same purpose and used in the same way. This latter process is said to be more economical in that the resulting solution of arsenic acid may be concentrated in ordinary porcelain vessels.

Oil of Juniper Berries.—Reports from the districts producing this oil are uniformly unfavorable and prices are likely to be considerably higher. The source of this oil, or of the berries, appears to be centred in Hungary and Italy. By far the greater amount of the available supply of oil of juniper berries is said to be obtained as a by-product in the preparation of juniper brandy in Hungary. The reason why these two southern countries supply the bulk of the available oil and berries is probably due to the fact related by Gildemeister and Hoffmann, that " the berries of northern countries are comparatively poor in oil, the Swedish berries containing as little as 0·5 per cent., while the southern, particularly the Italian, usually give upward of 1 or 1·5 per cent. of oil.

Oil of Lavender Flowers.—This is another oil, the price of which appears to have an upward tendency, owing to the unfavorable reports of the chief producing districts.

There appears to be a considerable difference of opinion among experts in essential oils as to the value of the ester-content test for lavender. E. Parry (*Chemist and Druggist*, 1902, page 168) argues that while tests for ester content are of value they are not necessarily an index of the quality or value of an oil of lavender from the perfumer's point of view.

This statement is vigorously attacked by Schimmel & Co. in their November report. They do, however, admit that the odor test is of considerable importance, and will always retain its place with any possible chemical tests.

In this connection it may be of interest to note that Schimmel & Co. in their April report say that a sample of oil of lavender that came under their observation contained 1·5 per cent. of benzoic acid. J. E. Weber, of Cincinnati, reports (*Chem. Zeitung*, 1902, page 875) finding 1 per cent. of salicylic acid in oil of lavender. Both of the adulterants had been added to increase the apparent ester number of the respective oils.

OIL OF MUSTARD.—This substance appears to be more extensively used in Europe than in this country. Oil of mustard was introduced into the United States Pharmacopœia of 1880, but does not appear to have met with favor as a rubefacient or counterirritant. This may be partially accounted for, no doubt, by the fact that the oil as well as the vapor arising from it are acrid and particularly irritating.

Synthetic oil of mustard is being produced on a large scale. Chemically there is no available means of differentiating it when of good quality. The contaminating addition sometimes found is carbon disulphide, but this has been found in the natural as well as the artificial oil. Under careless methods of manipulation the natural oil may contain appreciable quantities of allyl cyanide, and in this one feature at least the artificial oil appears to have some advantage over the natural.

OIL OF PEPPERMINT.—The available supply of this oil is decidedly below the average, and in addition to this, speculative purchasers have driven the price of the American product up to unheard-of figures. Schimmel & Co., in their report, give a list of quotations for this article, during the past twelve years. Beginning on October 1st, 1890, with $2.50 per pound, the price rose to $3 in 1892, and then declined steadily, reaching the abnormally low figure of 80 cents in 1899. This was of course much below the normal cost of production and resulted in the discontinuance of production on the part of many American farmers. With a corresponding decrease in the available supply prices gradually advanced, reaching the $2 mark on October 1, 1902. From this the price, due to speculative influences, reached the abnormally high quotation of $5 a pound before the end of the year.

The production of Japanese as well as English oil of peppermint has also been rather below the average, while the demand has been steadily increasing.

Germany has entered the field as a producer of oil of peppermint, furnishing a considerable quantity of oil of very fine quality. According to Schimmel & Co. the Saxon oil of peppermint has reached the highest degree of perfection and should be able to compete with the English distillate.

AN ITALIAN OIL OF PEPPERMINT has also been offered on the European market. Schimmel & Co. say this was formerly consumed in that country and not much exported. The oil has rather

a low menthol content (52·5 per cent.) and does not congeal when placed in a freezing mixture.

The price of menthol has, of course, also increased, in sympathy with that of oil of peppermint, and the combination has in turn had a very marked influence on the tendency to cheapen or adulterate both products. This, of course, again illustrates the oft-repeated truism that an article with a marked upward tendency is very liable to be adulterated, one reason being the repeated attempts of dealers to neutralize probable loss by the addition of a cheaper grade of material. In this connection a statement of J. A. S. Woodrow (*Druggists' Circular*, 1903, page 63) is of interest. He reports on two lots of oil of peppermint which he had examined and found adulterated with oil of sassafras or oil of camphor.

The more popular, or rather more frequently practised method of cheapening oil of peppermint is to rob it of the contained free-menthol. E. J. Parry, in a recent number of the *Chemist and Druggist*, reports examining ten samples of oil of peppermint. The specific gravity of the ten samples varied from 0·880 to 0·904; not one of them dissolved in three volumes of 90 per cent. alcohol, and none separated out any menthol when cooled to 10° C. with the addition of a few crystals of menthol.

Oil of Rose.—This is the most variable of all the essential oils. The statement has been repeatedly made that it is practically impossible to get an absolutely pure oil of rose anywhere. E. J. Parry (*Drug. Circ.*, 1902, page 102, from *Chem. and Drug.*) considers pure otto of rose obtainable even at the present time, and simply a matter of price. According to Parry, oil of rose is more largely adulterated by middlemen than by the actual producers.

The adulteration of this article has, of course, become what might be termed a fine art, some of the adulterants being extremely difficult to detect. A rather novel adulterant is reported on by Schimmel & Co. It consists of oil of rose-geranium to which a mixture of salol and antipyrine has been added, with a view of bringing the congealing point up to the desired degree. It is said that this combination has the property of bringing the congealing point of the resulting mixture up to any desired height.

When suspected, the adulteration is, of course, readily detected by the appropriate chemical tests.

The repeated attempts of improving on the primitive methods of

the Bulgarian rose-distillers have, so far at least, been but partially successful. There appears to be a considerable difference of opinion on the success or failure of a recent attempt to concentrate the manufacture of the oil in central factories, or large distilleries. There can be no doubt, however, that with improved appliances and greater care a much more economical and better paying process might be devised.

Artificial oil of rose has been an article of commerce for some time, and has met with considerable success. There are several manufacturers who are putting out an artificial oil, with or without an additional trade name. The composition of these mixtures differs very materially, the majority of them resembling oil of rose only in the odor and not in any of its other physical properties, though at least one concern is putting out an oil of rose having a stearoptene; but this firm does not recommend its use. It is said that in the manufacture of perfumes these artificial oils or mixtures are particularly applicable on account of the constant composition and ready solubility in alcohol.

Oil of Rosemary.—There are two commercial varieties of this oil: the so-called French, which is usually considered the finest and brings the highest price, and the Italian or Dalmatian; this is produced on several islands off the coast of Dalmatia. The product from these islands usually comes into the market through the Austrian port, Trieste, and in this country this oil is usually designated as oil of rosemary, Trieste.

Schimmel & Co. have obtained as high as 2 per cent. of oil from rosemary leaves. According to the same authority, oil of rosemary varies in specific gravity from 0·900 to 0·920.

Oil of Sandalwood.—The East Indian oil has materially increased in price on account of a report from Mysore that a disease had broken out among the sandalwood trees, which was rapidly spreading and had already killed off a number of trees.

According to a letter published by Schimmel & Co., the disease first made its appearance a little more than two years ago in Coorg, an adjoining province. So far no satisfactory means of preventing the spread of the disease have been devised, and if further information should confirm these statements, the price of sandalwood oil would probably reach a much higher figure in the near future.

Oil of Wintergreen.—This oil presents rather a complicated

problem. In addition to the crude adulterants, such as oil of turpentine and carbolic acid, there is available a substance that is actually better from a chemical point of view than genuine oil of wintergreen. From the comparative prices given above it will be seen that synthetic oil of wintergreen, as well as oil of sweet birch, are much lower in price than the pure oil of wintergreen. In addition to this, the content of methyl salicylate is in inverse ratio to the price. Opinions as to the therapeutic efficiency of the different oils differ very materially, several observers asserting that natural oil of wintergreen contains an irritant body that is objectionable, while others maintain that the natural oil is much more efficient than the artificial.

If, however, as is fair to suppose, methyl salicylate is the therapeutically efficient portion of oil of wintergreen, and if, as has been generally conceded, it is quite feasible to produce an absolute methyl salicylate, practically chemically pure, would it not be reasonable to give this the preference, and allow it to demonstrate its merits, instead of furnishing it, or rather buying it, at a very material advance under another name?

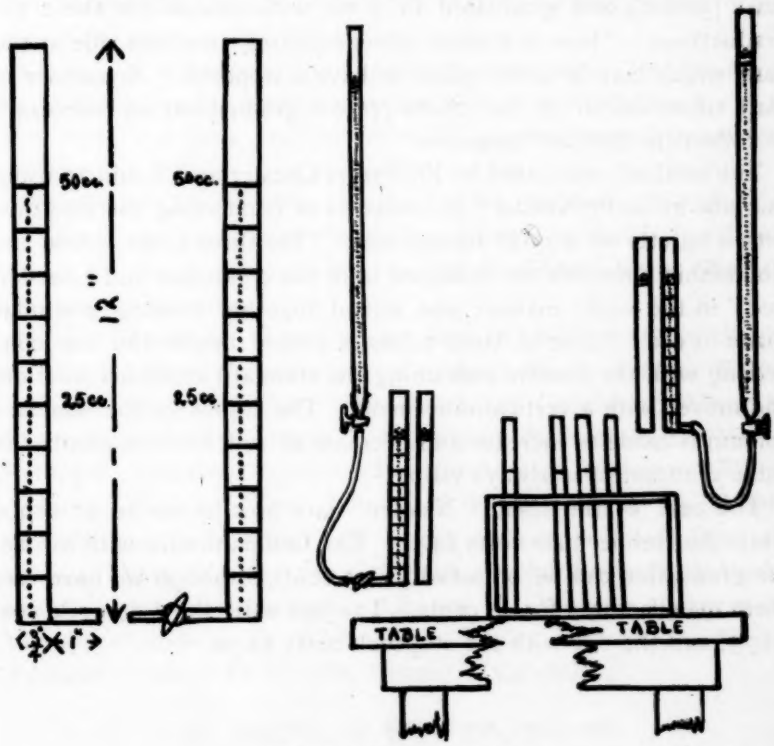
From a casual survey of the essential-oil question, as it presents itself at the present time, it would appear to be advisable to favor the adoption of active principles of the essential oils, wherever possible; and in cases where these essential or active principles are obtainable of as good or even better quality, made synthetically, there would appear to be no substantial reasons why they should not be given the preference.

MODIFICATION OF NESSLER'S TUBE.

By Herbert J. Watson, P.D.

The "Nessler" jar is one of the most useful and indispensable articles in the laboratory. Its value to the sanitarian is almost equal to that of the mortar and pestle or graduate to the pharmacist. The hours spent with this simple apparatus are long and tedious, especially when trying to secure the desired shade by pouring back and forth the liquid in the comparison tube. The principal use of the "Nessler" jar is in the determination of free and albuminoid ammonia and the estimation of nitrites in water. The determination of free and albuminoid ammonia, in bacteriological researches, is another extensive field for its use.

The process for determining ammonia may here be described for the benefit of those having a limited, or no use for the jar. The Wanklyn's method employs 200 c.c. of ammonia free water with about 10 c.c. of saturated sodium carbonate solution to clean the apparatus. After two 50 c.c. jars have passed through the condenser, 500 c.c. of the suspected water is added to the remaining 100 c.c., plus the sodium carbonate solution in the flask. Three 50 c.c. tubes, containing the free ammonia, are collected, and then the 50 c.c. of the alkaline potassium-permanganate solution (200 grammes of potassium hydrate and 8 grammes potassium permanganate to the



Modified Nessler's Tube.

litre) is added to the flask and the distillation continued until three tubes of the albuminoid ammonia are collected, and then the entire six are nesslerized. Two c.c. of Nessler's reagent is also added to the standard tubes containing ·01 milligramme, ·02 milligramme and higher strengths of the ammonia. The strength of the different tubes is calculated in parts per million.

The "Nessler" jar used in the above analysis is about 6 inches in length, but a jar designed by Hehner, containing 100 c.c., with a stopcock, is also on the market. The Hehner tube is too wide and costs entirely too much. The objection to the diameter of these two jars is overcome by the tube mentioned below, which is the same as that of the one devised by Dr. Leffmann. This jar is very much more delicate in colorimetric work than the shorter jars (50 c.c.) in use in many laboratories.

The jar (which is illustrated in an accompanying cut) is 12 inches in length, ¾ inch in diameter, about 9 inches from base to top mark (50 c.c.), and graduated in 5 c.c. with dashes for the 1 c.c. graduations. There is a small tube projecting from the side at the base, which may be either plain or have a stopcock. A number of plain tubes similar to the above (50 c.c. graduation) are necessary to collect the distilled ammonia.

The method, originated by Professors Chester and Robin, of using this side-necked "Nessler" jar, consists of connecting the side tube with a burette by a small rubber tube. The three tubes of free and albuminoid ammonia are collected from the condenser and "nesslerized" in the usual manner and mixed together, causing a similar shade in each. One of these tubes is placed beside the one connecting with the burette containing the standard ammonia solution, and moved with a vertical movement. The liquid in the standard column is made to increase and decrease at will, and the number of cubic centimetres is always visible.

The cost of the small "Nessler" jars now in use is 50 cents, while the Hehner tube costs $4.50. The Leffmann tube with the single graduation can be obtained for 75 cents, although we have had them manufactured for 40 cents. The jars with the side neck cost $1.75, and the one with the stopcock costs $2.50.

CARNEGIE INSTITUTION OF WASHINGTON.[1]

MEETING OF INCORPORATORS OF THE CARNEGIE INSTITUTE OF WASHINGTON.

By President Daniel C. Gilman.[2]

The meeting of the Incorporators of the Carnegie Institution was held at the office of the Secretary of State, Washington, D. C., January 4, 1902, at 10 o'clock A.M.

Present: Hon. John Hay, Secretary of State; Justice Edward D. White, Dr. Daniel C. Gilman, Dr. John S. Billings, Hon. Carroll D. Wright and Dr. Charles D. Walcott. Mr. Hay was chosen chairman of the meeting and Mr. Walcott secretary.

On receipt of notice of the filing of the Articles of Incorporation, Mr. White moved that the incorporators proceed to ballot for trustees. This was done, and the following persons were unanimously elected:

Ex officio.—The President of the United States, the President of the Senate, the Speaker of the House of Representatives, the Secretary of the Smithsonian Institution, the President of the National Academy of Sciences.

Grover Cleveland, New Jersey; John S. Billings, New York; William N. Frew, Pennsylvania; Lyman J. Gage, Illinois; Daniel C. Gilman, Maryland; John Hay, District of Columbia; Abram S. Hewitt, New Jersey; Henry L. Higginson, Massachusetts; Henry Hitchcock, Missouri; Charles L. Hutchinson, Illinois; William Lindsay, Kentucky; Seth Low, New York; Wayne MacVeagh, Pennsylvania; D. O. Mills, New York; S. Weir Mitchell, Pennsylvania; William W. Morrow, California; Elihu Root, New York; John C. Spooner, Wisconsin; Charles D. Walcott, District of Columbia; Andrew D. White, New York; Edward D. White, Louisiana; Carroll D. Wright, District of Columbia.

FIRST MEETING OF BOARD OF TRUSTEES.

The Trustees assembled in the Diplomatic Room, Department of State, Washington, D. C., Wednesday, January 29, 1902, at half-past 2. They were called to order by Hon. Abram S. Hewitt,

[1] Abstracts from the Year Book, No. 1, 1902.

[2] Owing to the great interest attaching to the work of the Carnegie Institution of Washington, the report of the president is reprinted from *Science*, January 30, 1903, for the benefit of our readers.

who nominated for temporary chairman Hon. John Hay, who was unanimously elected and took the chair. Mr. Hewitt then nominated Dr. Charles D. Walcott as temporary secretary, and he was unanimously elected.

The secretary then read the minutes of the meeting of the incorporators and presented the Articles of Incorporation, after which Mr. Andrew Carnegie was introduced by the chairman, and made the remarks which have been printed.

The following resolution was presented and unanimously adopted:

"In addition to the personal and individual expressions extended to Mr. Carnegie for what he has done for the world to-day:

"*Resolved*, That the chairman of this meeting be requested to draft a letter addressed to Mr. Carnegie expressing the views of the Trustees concerning this magnificent gift and the purposes for which it is to be applied as set forth in the letter and other documents which have just been read."

Attention was called to the vacancy on the Board caused by the declination of Hon. Grover Cleveland, who had not found it possible to accept a place on the Board on account of his health. The Board balloted for a trustee to fill a vacancy thus arising, and Mr. William E. Dodge, of New York, was unanimously elected.

A proposed code of by-laws was then presented, discussed, amended and adopted.

Election of officers was then held with the following result:

Chairman of the Board of Trustees—Abram S. Hewitt.

Vice-Chairman of the Board of Trustees—John S. Billings.

Secretary of the Board of Trustees—Charles D. Walcott.

President of Carnegie Institution—Daniel C. Gilman.

Relative to the acceptance of the trust created by Mr. Carnegie, it was

Resolved, That the Board of Trustees, acknowledging the generosity of the gift of Mr. Carnegie, in the foundation of the Institution, desire to express the concurrence of the Trustees in the scope and purpose stated in his deed of trust, and hereby formally accept the donation and the responsibilities connected with it.

It was also voted that the resolution just adopted be forwarded to Secretary Hay, to be by him sent to Mr. Carnegie, with a letter expressing the views of the Trustees on the gift. Mr. Hay subsequently transmitted the resolution and with it the following letter:

DEPARTMENT OF STATE,
WASHINGTON, March 7, 1902.

HON. ANDREW CARNEGIE,
5 West Fifty-first Street, New York City.

SIR :—The Trustees of the Carnegie Institution, which you have recently founded in the city of Washington, formally accept your gift, by the adoption of the appended resolution.

At the same time they requested me, as the presiding officer at the first meeting of the Board, to convey to you by a letter an explanation of their hearty appreciation of your munificence, and also their admiration of the noble purpose and the liberal spirit which distinguish your foundation.

For the advancement of knowledge and the education of youth there are already in this country many strong institutions, learned societies, universities, government bureaus, libraries and museums. With all of them the Carnegie Institution can co-operate, while it has a field of its own, carefully indicated in your deed of gift, and more fully explained by the remarks which you addressed to the Board.

Every one of those whom you have chosen as Trustees will regard it as a sacred duty and a pleasure to uphold the lofty ideal that you have set before them, and to impart to those who come afterward the spirit of confidence and enthusiasm with which the work has begun.

I am, Sir,

Very respectfully yours,
JOHN HAY.

Dr. Gilman, the elected president, then addressed the Board, explaining, so far as they were known to him, the circumstances which preceded the incorporation of the Carnegie Institution. His remarks were extemporaneous and intended to acquaint the Board with his attitude and that of the gentlemen with whom, at Mr. Carnegie's request, he had been associated in these arrangements which preceded the meeting of the Board. He expressed his appreciation of the honor conferred upon him by his selection as president of the Institution, and he indicated in broad outlines the probable methods of procedure. At an early day experts in many branches of science will be selected by the Executive Committee to whom all applications for encouragement and aid will be referred. These experts will be requested to add their own suggestions, and present their recommendations in writing. Meanwhile, the Executive Committee will gather information in respect to endowments and establishments for promoting science, at home and abroad, in order that this experience may be at the service of the Trustees, and that there may be co-operation, and not conflict, with other institutions in any plans that may be adopted.

After discussing nominations the following named persons were elected members of the Executive Committee: John S. Billings, Daniel C. Gilman, Abram S. Hewitt, S. Weir Mitchell, Elihu Root, Charles D. Walcott, Carroll D. Wright.

The following resolutions were then considered and adopted:

Resolved, That the Executive Committee is requested to prepare a report upon the work which should be undertaken by the Carnegie Institution in the near future, such report to be submitted to the Board of Trustees at its next meeting, and to be accompanied with estimates for expenditures required.

Resolved, That the Executive Committee, when it shall have formulated plans of the work which should be undertaken by the Carnegie Institution, shall have the same printed and a copy forwarded to each Trustee prior to the annual meeting in November, 1902.

Resolved, That the Executive Committee is requested to consider the question of a proper administration building for the Carnegie Institution, to be located in Washington, including both a proper site and plans for the same.

SECOND MEETING OF THE BOARD OF TRUSTEES.

The meeting was held in Washington, at the New Willard Hotel, on Tuesday, November 25, 1902, at 10 A.M.

The president of the Institution, Mr. Gilman, made a general statement of the work of the Executive Committee and referred to the report of the committee, which had been printed and distributed to the Trustees in advance of the meeting.

The secretary made a brief report, referring principally to the financial transactions of the Institution.

Consideration of the Executive Committee's report was then taken up, and a long discussion followed on the various recommendations made by the committee.

At the second session the Board resumed its discussion of policy and the recommendation of the Executive Committee, especially the purchasing of a site. As the outcome a motion to postpone till the next annual meeting the decision on the question of site was made and carried.

The Board then considered and adopted the following resolution:

Resolved, That from the available income of the Institution

$50,000 is hereby appropriated for administrative expenses, $200,000 for grants for research during the fiscal year 1902–03, $40,000 for a publication fund, the expenditures to be made under the direction of the Executive Committee, and that $100,000 of the available income of the Institution be set apart for a reserve fund during the fiscal year 1902–03.

Amendments to the by-laws were then considered, and the date of the annual meeting was changed from November to the second Tuesday of December, beginning with the year 1903. By-laws were also adopted providing that the fiscal year of the Institution shall be from November 1st to October 31st, inclusive, and that there shall be a finance committee consisting of three members of the Board, to be elected by the Board and to hold office until their successors are elected. The duty of such finance committee shall be to consider and recommend to the Board of Trustees such measures as it may believe will promote the financial interests of the Institution. The Board then proceeded to the choice of a finance committee, and elected Messrs. Gage, Mills and Higginson.

The following minute relative to the death of Mr. Henry Hitchcock was presented by Mr. Higginson and adopted by the Board:

The death of Mr. Henry Hitchcock has deprived this Board of Trustees of a cultured and wise counsellor, a progressive leader and a valued associate. Mr. Hitchcock stood for all that was noble in manhood and the development of man. His every effort was to serve any cause with which he was connected with all the power and ability he possessed. We tender to the members of his bereaved family sincere sympathy, and place this resolution in our minutes as a permanent record of our appreciation and esteem.

The Board then proceeded to fill the vacancy caused by the death of Mr. Hitchcock. Mr. Ethan Allen Hitchcock was nominated and unanimously elected.

PROCEEDINGS OF EXECUTIVE COMMITTEE.

Organization.—At its first meeting the committee organized by electing Mr. Gilman chairman and Mr. Walcott secretary. At the same time lots were drawn for the terms of service of members, three to expire with the annual meeting in 1903, two in 1904 and two in 1905. The result of the drawing was as follows:

1903, Gilman, Mitchell, Wright; 1904, Billings, Walcott; 1905, Hewitt, Root.

Advisory Committees.—As soon as it was organized the Executive Committee, in compliance with the instructions of the Trustees, began an investigation to determine what work should be entered upon, in the immediate future, by the Institution. Its first step consisted in the appointment of advisory committees. Eighteen such committees were appointed, as follows:

Anthropology.—William H. Holmes, Chief, Bureau of American Ethnology, and Head Curator, Department of Anthropology, U. S. National Museum, Washington, D. C., Chairman; Franz Boas, Curator, Department of Anthropology, American Museum of Natural History, New York, N. Y.; George A. Dorsey, Field Columbian Museum, Chicago, Ill.

Astronomy.—E. C. Pickering, Professor of Astronomy and Director of Harvard Observatory, Cambridge, Mass., Chairman; Lewis Boss, Director of Dudley Observatory, Albany, N. Y.; George E. Hale, Director of Yerkes Observatory, Williams Bay, Wis.; S. P. Langley, Secretary Smithsonian Institute, Washington, D. C.; Simon Newcomb, late Superintendent of Nautical Almanac, Washington, D. C.

Bibliography.—Herbert Putnam, Librarian of Congress, Washington, D. C., Chairman; Cyrus Adler, Librarian Smithsonian Institute, Washington, D. C.; J. S. Billings, Director New York Public Library, New York, N. Y.

Botany.—Frederick V. Coville, Botanist, Department of Agriculture, Washington, D. C., Chairman; N. L. Britton, Superintendent New York Botanical Garden, New York, N. Y.; John M. MacFarlane, Professor of Botany, University of Pennsylvania, Philadelphia, Pa.; Gifford Pinchot, Forester, U. S. Department of Agriculture, Washington, D. C.

Chemistry.—Ira Remsen, Professor of Chemistry and President of Johns Hopkins University, Baltimore, Md., Chairman; T. W. Richards, Professor of Chemistry, Harvard University, Cambridge, Mass.; Edgar F. Smith, Professor of Chemistry, University of Pennsylvania, Philadelphia, Pa.

Economics.—Carroll D. Wright, Commissioner of Labor, Washington, D. C., Chairman; Henry W. Farnam, Professor of Political Economy, Yale University, New Haven, Conn.; John B. Clark, Professor of Political Economy, Columbia University, New York, N. Y.

Engineering.—R. H. Thurston, Director of Sibley College, Cor-

nell University, Ithaca, N. Y., Chairman; William H. Burr, Professor of Civil Engineering, Columbia University, New York, N. Y; George Gibbs, Consulting Engineer, Baldwin Locomotive Works, Philadelphia, Pa.; George S. Morison, Civil Engineer, 49 Wall Street, New York, N. Y.; Charles P. Steinmetz, Electrician, General Electric Company, Schenectady, N. Y.

Geography.—William M. Davis, Professor of Geology, Harvard University, Cambridge, Mass.

Geophysics.—[Joint Committee on Geology and Physics.]

Geology.—T. C. Chamberlin. Head of Geological Department and Director of Museum, University of Chicago, Chicago, Ill., Chairman; Charles R. Van Hise, Professor of Geology, University of Wisconsin, Madison, Wis.; Charles D. Walcott, Director of Geological Survey, Washington, D. C.

History.—J. Franklin Jameson, Head of Department of History, University of Chicago, Chicago, Ill., Chairman; Charles Francis Adams, Boston, Mass.; Andrew C. McLaughlin, Professor of American History, University of Michigan, Ann Arbor, Mich.

Mathematics.—E H. Moore, Head Professor of Mathematics, University of Chicago, Chicago, Ill., Chairman; Frank Morley, Professor of Mathematics, Johns Hopkins University, Baltimore, Md.; Ormond Stone, Professor of Astronomy and Director of Leander McCormick Observatory, Charlottesville, Va.

Meteorology.—Cleveland Abbe, Professor of Meteorology, U. S. Weather Bureau, Washington, D. C.

Paleontology.—Henry F. Osborn, DaCosta Professor of Zoology, Columbia University, New York, N. Y., Chairman; Henry S. Williams, Professor of Geology, Yale University, New Haven, Conn.

Physics.—R. S. Woodward, Dean of School of Pure Science and Professor of Mechanics and Mathematical Physics, Columbia University, New York, N. Y., Chairman; Carl Barus, Professor of Physics, Brown University, Providence, R. I.; A. A. Michelson, Head Professor of Physics, University of Chicago, Chicago, Ill.

Physiology (including Toxicology).—S. Weir Mitchell, Philadelphia, Pa., Chairman; H. P. Bowditch, Professor of Physiology, Harvard Medical School, Cambridge, Mass.; William H. Howell, Dean of Johns Hopkins Medical School, Baltimore, Md.

Psychology.—J. Mark Baldwin, Professor of Psychology, Princeton University, Princeton, N. J.

Zoology.—Henry F. Osborn, DaCosta Professor of Zoology, Columbia University, New York, N. Y., Chairman; Alex. Agassiz, Curator Natural History Museum, Cambridge, Mass.; W. K. Brooks, Professor of Zoology, Johns Hopkins University, Baltimore, Md.; C. Hart Merriam, Chief U. S. Biological Survey, Washington, D. C.; E. B. Wilson, Professor of Zoology, Columbia University, New York, N. Y.

These advisers were requested to give the committee their views on various important suggestions received by the Institution, as well as independent recommendations originating in the committees. The following is a copy of the letter appointing the advisers and inviting suggestions and recommendations:

MARCH 11, 1902.

DEAR SIR:—The Executive Committee of the Carnegie Institution has been requested by the Trustees to prepare, in the course of the summer, a plan of procedure, and in the meantime to engage in preliminary studies of the problems committed to them, by consultation with acknowledged authorities at home and abroad.

The plan of the Institution includes the appointment rom time to time of counsellors, or advisers, to whom the committee may refer important suggestions, and from whom they may receive independent recommendations. You are invited to act as one of these advisers until the annual meeting of the Trustees, in November next. It is the purpose of the Institution to provide liberally for any expense that may be incurred in clerical service and in travel by those whom they may consult. If it is agreeable to you to accept this invitation, a more personal communication will be addressed to you at an early day. An immediate answer is requested.

Respectfully,

D. C. GILMAN, President.

The reports received from the Advisory Committees, so far as they relate to scope and plan, are printed in Appendix A.

A circular letter was also prepared and sent to nearly 1,000 scientific men and investigators of prominence, mainly in the United States. This was accompanied by a pamphlet that included the articles of incorporation, the founder's address and a list of the officers. The circular letter is as follows:

Letter to the Heads of American Institutions and to Others Interested in the Work of Investigation.

The Carnegie Institution sends you herewith a copy of Mr. Carnegie's deed of gift and other information in respect to the organization of the new foundation.

Some of the ablest thinkers and investigators in the country have already called attention to important lines of inquiry. Their communications will be referred to special committees in different departments of knowledge—astronomical, physical, chemical, biological, geological, archæological, philological, historical, bibliographical, economical, etc.—and the referees will be requested to add their own suggestions and to report to the Carnegie Institution such methods of procedure and the names of such investigators as they deem likely to advance with wisdom the great purpose of the foundation.

No large appropriations can be made at present, as there will be no income from the fund before August. The summer will be chiefly devoted to a careful study of the problems of scientific investigation, at home and abroad, and in the autumn definite plans of procedure will be formulated.

Any member of the Executive Committee will be glad to receive from you at any time, suggestions, opinions and advice as to fields that the Carnegie Institution ought to occupy and the best methods for carrying forward its work in those fields; but in order that important papers designed for official consideration may be properly recorded and filed, they should be addressed to the President of the Carnegie Institution, 1439 K Street, Washington. D. C.

DANIEL C. GILMAN, Chairman,
CHARLES D. WALCOTT, Secretary,
JOHN S. BILLINGS,
ABRAM S. HEWITT,
S. WEIR MITCHELL,
ELIHU ROOT,
CARROLL D. WRIGHT,
Executive Committee.

March, 1902.

For its guidance, the committee has formulated and adopted the following statements as to its purposes, principles, organization and policy:

Purposes.—In connection with the determination of the policy of the Institution, it is necessary to clearly define its purposes and to adopt some general plan for organization and administration. The purposes are declared by the founder to be:

"To found in the city of Washington an institution which, with the co-operation of institutions now or hereafter established, there or elsewhere, shall in the broadest and most liberal manner encourage investigation, research and discovery—show the application of knowledge to the improvement of mankind, provide such buildings, laboratories, books and apparatus as may be needed, and afford instruction of an advanced character to students properly qualified to profit thereby."

And he adds:

"That his chief purpose is to secure, if possible, for the United States of America, leadership in the domain of discovery and the utilization of new forces for the benefit of man."

The trust deed enumerates several aims, all of which may be grouped under two heads, viz.:

(A) To promote original research.

(B) To increase facilities for higher education.

Under (A) may be grouped:

(*a*) The promotion of original research "as one of the most important of all subjects."

(*b*) To discover the exceptional man . . . and enable him to make the work for which he seems specially designed his life-work.

(*c*) The prompt publication and distribution of the results of scientific investigation.

Under (B) may be grouped:

(*a* and *b*) The increase of facilities for higher education by increasing the efficiency of the universities and other institutions, either by utilizing and adding to their existing facilities, or by aiding teachers in various institutions in experimental and other work.

(*c*) To enable such students as may find Washington the best point for their special studies to take advantage of the facilities there for higher education and research.

Principles.—It is the judgment of the Executive Committee that the aims enumerated can be best carried into effect under the following principles, which are to be departed from only in very exceptional cases.

The Institution proposed to undertake—

(A) To promote original research by systematically sustaining—

(*a*) Projects of broad scope that may lead to the discovery and utilization of new forces for the benefit of man, pursuing each with the greatest possible thoroughness.

(*b*) Projects of minor scope that may fill in gaps in knowledge of particular things or restricted fields of research.

(*c*) Administration of a definite or stated research under a single direction by competent individuals.

(*d*) Appointment of research assistants.

(B) To increase facilities for higher education by promoting—

(*a*) Original research in universities and institutions of learning by such means as may be practicable and advisable.

(*b*) The use by advanced students of the opportunities offered for special study and research by the Government bureaus in Washington.

The Institution does not propose to undertake—

(*a*) To do anything that is being well done by other agencies.

(*b*) To do that which can be better done by other agencies.

(*c*) To enter the field of existing organizations that are properly equipped or are likely to be so equipped.

(*d*) To give aid to individuals or other organizations in order to relieve them of financial responsibilities which they are able to carry, or in order that they may divert funds to other purposes.

(*e*) To enter the field of applied science except in unusual cases.

(*f*) To purchase land or erect buildings for any organization.

(*g*) To aid institutions when it is practicable to accomplish the same result by aiding individuals who may or may not be connected with institutions.

(*h*) To provide for a general or liberal course of education.

Organization.—The Executive Committee, keenly realizing the importance of thoroughly investigating and fully considering every proposed action before recommending it to the Trustees, has given much time and thought to the subject of organization, and at the several meetings has discussed the suggestions received from individuals and from the Advisory Committees. It is hoped and expected that the Institution will set a high standard for research. This, the committee believes, can be best attained and maintained by establishing such laboratories and facilities, not found elsewhere, as are necessary when dealing with problems.

The committee is of the opinion that organization in Washington should be provided for by—

(*a*) Purchasing in the northwestern suburb of the city a tract of ground suitable for present and future needs.

(*b*) Erecting thereon a central administration building, to serve as the administrative headquarters of research work conducted, directed or aided by the Carnegie Institution.

(*c*) Establishing such laboratories from time to time as may be deemed advisable.

(*d*) Employing the best qualified men that can be secured for carrying on such research work as it may be decided to undertake in Washington.

(*e*) Continuing and developing the present office organization as the Executive Committee may find it necessary to do in order to properly conduct the work of the Institution.

The only organization outside of Washington to be provided for at present should be such advisers and advisory committees as may from time to time be found necessary in connection with the development of the research work of the Institution. It is the opinion of the committee that such persons and committees should be largely advisory and not executive in their function. Executive work should be in charge of paid employees of the Institution. These may be officers, research associates and special employees.

Policy.—Soon after the Executive Committee began its investigations it became evident that two lines of policy were open, namely:

(*a*) To sustain broad researches and extended explorations that will greatly add to knowledge.

(*b*) To make small grants.

Research may be defined as original investigation in any field, whether in science, literature or art. Its limits coincide with the limits of the knowable. In the field of research the function of the Institution should be organization, the substitution of organized for unorganized effort wherever such combination of effort promises the best results; and the prevention, as far as possible, of needless duplication of work. Hitherto, with few exceptions, research has been a matter of individual enterprise, each worker taking up the special problem which chance or taste led him to and treating it in his own way. No investigator, working single-handed, can at present approach the largest problems in the broadest way thoroughly and systematically.

With an income large enough to enter upon some large projects and a number of minor ones, it appears to be wiser, at the beginning, to make a number of small grants and to thoroughly prepare to take up some of the larger projects. With this in view the Executive Committee recommended to the Trustees that there be placed at its disposal for the fiscal year 1902–03, $200,000 for aid to special researches in various branches of science, and $40,000 for the publication of the results achieved. During the year plans will be perfected, data secured and experience gained that will be of great service in formulating recommendations for the ensuing year.

In the opinion of the committee, the most effective way to discover and develop the exceptional man is to put promising men upon research work under proper guidance and supervision. Those who do not fulfil their promise will soon drop out, and by the sur-

vival of the fittest the exceptionally capable man will appear and be given opportunity to accomplish the best that is in him. When the genius is discovered, provide him with the best equipment that can be obtained.

In making grants, the wisest policy appears to be to make them to individuals for a specific purpose rather than to institutions for general purposes.

Grants.—Under the authority conferred upon it by the Trustees at their first meeting, the Executive Committee made three grants, as follows:

March 25, 1902. To the Marine Biological Laboratory, Woods Hole, Mass., for general support	$4,000
April 15, 1902. To Dr. J. McK. Cattell, Columbia University, New York, for preparing a list of the scientific men of the United States	1,000
April 15, 1902. To Dr. Hideyo Noguchi and Professor Simon Flexner, Philadelphia, Pa., for continuation of their studies of the toxicological actions of snake-venom and allied poisons	1,000
Total	$6,000

Since the second meeting of the Trustees, on November 25, 1902, the Executive Committee has made the following grants in the several departments of science mentioned; anthropology, mathematics and other branches will be acted upon later:

Astronomy	$21,000
Bibliography	15,000
Botany	11,700
Chemistry	3,000
Economics	15,000
Engineering	4,500
Exploration	5,000
Geology	12,000
Geophysics	8,500
History	5,000
Investigation of project for southern and solar observatory	5,000
Investigation of project for physical and geophysical laboratories	5,000
Investigation of natural-history projects	5,000
Marine biological research	12,500
Paleontology	1,900
Physics	4,000
Carried forward	$134,100

Brought forward	$134,100
Physiology	5,000
Psychology	1,600
Publications	5,500
Research assistants	25,000
Student research work in Washington	10,000
Zoology	4,000
Total	$185,200

CHARLES D. WALCOTT,
Secretary.

SUMMARY.

As a convenient summary of the plans and methods thus far agreed upon, the following minute is approved:

The methods of administration of the Carnegie Institution thus far developed are general rather than specific.

The encouragement of any branch of science comes within the possible scope of this foundation, but as the fund, munificent as it is, is inadequate to meet the requests for aid already presented, not to mention others which are foreseen though not yet formulated, attention has been concentrated upon a selection of those objects which, at this time and in our country, seem to require immediate assistance.

Efforts have been and will be made to secure co-operation with other agencies established for the advancement of knowledge, while care will be exercised to refrain from interference or rivalry between them. Accordingly, ground already occupied will be avoided. For example, if medical research is provided for by other agencies, as it appears to be, the Carnegie Institution will not enter the field. Systematic education, abundantly provided for in this country by universities, colleges, professional schools, and schools of technology, will not be undertaken. Nor will the assistance of meritorious students in the early stages of their studies come within the scope of this foundation. Sites or buildings for other institutions will not be provided.

Specific grants have been and will be made, for definite purposes, to individual investigators, young or old, of marked ability, and for assistance, books, instruments, apparatus and materials. It is understood that such purchases are the property of the Carnegie Institution and subject to its control. The persons thus aided will be expected to report upon the methods followed and the results

obtained. In the publication of results it is expected that the writer will say that he was aided by the Carnegie Institution of Washington, unless it be requested that this fact be not made known.

In order to carry out the founder's instructions in respect to bringing to Washington highly qualified persons who wish to profit by the opportunities for observation and research afforded by the various scientific bureaus of the United States Government, a certain sum is set apart for this purpose.

In addition, the Carnegie Institution will appoint from time to time a number of persons to be known as research assistants, who may or may not reside in Washington, and who shall undertake to carry on such special investigation as may be intrusted to them by the Institution. The appointments will be made for a year, and may be renewed in any case where it seems desirable. Permission may be given to go abroad, if special advantages not accessible in this country can thus be secured.

Publication is regarded by the founder as of special importance. Accordingly, appropriations will be made for this purpose, especially for the printing of papers of acknowledged importance, so abstruse, so extended or so costly that without the aid of this fund they may not see the light.

With respect to certain large undertakings involving much expense, which have been or may be suggested, careful preliminary inquiries have been and will be made.

In order to secure the counsel of experts in various departments of knowledge, special advisers have been and will be invited from time to time for consultation. Valuable suggestions and counsel have already been received from such advisers.

RECENT LITERATURE RELATING TO PHARMACY.

THE COMPOSITION OF INDIA-RUBBER.

At a recent meeting of the Northwestern section of the American Chemical Society at Boston, Mass., Dr. C. O. Weber, of Manchester, England, gave an account of researches on rubber. India-rubber, no matter from what source, is, when freed from albuminous and resinous substances, composed of two substances: one, amounting to 4 per cent. or less, is insoluble in all solvents, and corresponds to the formula $C_{30}H_{68}O_{10}$; the other is a hydrocarbon, $nC_{10}H_{16}$. On

dry distillation the hydrocarbon gives isoprene, inactive limonene and heveëne. Isoprene, on standing, polymerizes into rubber. Recently nitro-derivatives have been obtained from rubber, which being produced quantitatively and soluble in many liquids, are useful in the examination of rubber, and will aid in further elucidating its composition. The bodies are, empirically, $C_{10}H_{16}N_2O_3$ and $C_{10}H_{16}N_2O_4$. Rubber is probably a polymerized unsaturated hydrocarbon, with an open chain and three double bonds for $C_{10}H_{16}$. Kondadoff obtained, synthetically, a compound that seems to be a methyl-derivative of rubber, thus making an important step in the synthesis of this product. Vulcanization consists solely in the addition of sulphur when pure rubber is used. The condition of rubber can be materially changed by manipulation between rollers; it then becomes more easily acted on by oxydizing agents. The proportion of sulphur taken up on vulcanization ranges from that required for the formula $C_{100}H_{160}S$ to that required for $C_{100}H_{160}S_{20}$.—*Science*, January 23, 1903. HENRY LEFFMANN.

GINSENG CULTURE.

Bulletin 62, of the Pennsylvania State Agricultural Experiment Station, gives an account of some studies made at the station to determine whether ginseng can be grown profitably as a cultivated crop. The demand for it by the Chinese seems to be unabated and the wild supply is annually diminishing. The Pennsylvania experiments have been going on for five years, and have resulted successfully. The best crops were obtained from the planting of two-year-old plants obtained from a professional cultivator of ginseng. The total yield of the station's work was 5 pounds and 1 ounce of dried root, for which a dealer paid at the rate of $8.50 per pound. Figuring on this basis, it is estimated that in five years an acre would yield a profit of $15,000, which does not include any allowance for the cost or rental of land. The cultivated roots are larger than those of the wild plants. As yet, no insect injurious to the plant has been noticed, but a fungus present in the soil of woods is at times very serious. A ground-worm is also an enemy. The details of cultivation and preparation for the market are given in the bulletin. H. L.

NOTES ON ESSENTIAL OILS.

While we are frequently reminded of the purity of synthetic products and of the cheapness of synthetic perfumes, as compared to

the natural ones, nevertheless there is a certain satisfaction in knowing that the cultivation of perfume plants is still a fruitful industry and one which is receiving the closest scientific attention, as set forth in the *Scientific and Industrial Bulletin of Roure-Bertrand Fils of Grasse.* (Series 1, No. 6, October, 1902.)

Messrs. Charabot and Hebert are conducting a series of "Chemical Investigations on the Vegetation of Perfume-Yielding Plants," and in this number they consider the chemical variations in a plant subjected to the influence of sodium nitrate. Under the head of "Contributions to the Study of Essential Oils," it is reported that the oil of mandarine leaves (*Citrus madurensis*) contains about 50 per cent. of methyl methylanthranilate, which substance has hitherto been found in small proportions in only a few essential oils. In this same paper it is also reported that Russian otto of rose, as compared to the German and Oriental products, contains a greater proportion of rhodinol than geraniol, whereas the reverse is true with the others, a difference probably due to climatic conditions.

A useful feature of this number of the *Bulletin* is the review of recent publications on the perfumes and essential oils. Here attention is called to the fact that Von Baeyer and Villiger (*Ber.*, **34**, 2679) have introduced into the chemistry of the terpenes the idea of the tetravalency of oxygen, which the recent researches of Fosse tend to confirm. It appears that in cineol (eucalyptol) $C_{10}H_{18}O$, the oxygen atom behaves as a tetravalent element, and in this way combines, by addition, not only with phosphoric and arsenic acids, but also with hydroferrocyanic, hydroferricyanic and hydrocobalticyanic acids.

In a summary of the recent papers relating to the oils of eucalyptus, it is pointed out that R. T. Baker and H. G. Smith (*Proc. Roy. Soc. N. S. Wales*, **35**) have established a relation between the anatomical characters of the leaves of eucalyptus and the chemical composition of the oils which they elaborate; and it is thought that these observations, if continued, will be fruitful of philosophic generalizations.

F. YAPLE.

ASSAY OF CANTHARIDES.

In December, 1901, Puran Sing presented to the Pharmaceutical Society of Japan an interesting paper dealing with the chemical properties of cantharidin, the form in which it occurs in the insect

powder, and finally the methods used in its isolation and estimation. These latter the author found defective, and he proposed a simple method whereby the powder was saponified with sodium hydrate, and the sodium cantharidate thus formed was extracted with alum solution, this extract yielding, on concentration, crystals of cantharidin and a basic salt of alum.

Since then (*Jour. Pharm. Soc. Japan*, No. 244, June, 1902) Mr. Sing has modified this method (called Dr. Nagai's Method, out of courtesy) somewhat, and he now recommends first extracting the fat and cantharidin with a solvent like chloroform, after which the saponification is effected.

Still another method, which he calls the "nitric-acid process," yields even better results. Twenty-five grammes of the powder are treated with 10 c.c. of strong nitric acid diluted to 200 c.c., the whole evaporated to dryness by the use of a little gypsum and the residue extracted with chloroform. The solution yields an abundance of crystals which are accompanied by a very yellow, heavy, oily substance that can be removed by the use of a very small amount of ether. The cantharidin is then re-crystallized. By this process Japanese cantharides yielded 1·9591 per cent. of cantharidin, melting at 207–210° C. F. Y.

CORRESPONDENCE.

UNITED STATES PHARMACOPŒIAL AFFAIRS.

DEAR EDITOR:—The following circular letter, under date of March 18th, from Prof. Jos. P. Remington, Chairman of the Committee on Revision of the United States Pharmacopœia, to the members of the committee, may prove of interest to your readers.

Very truly,

H. M. WHELPLEY,

ST. LOUIS, March 23, 1903. *Secretary U.S.P. Convention.*

"MEETING OF THE DIPHTHERIA ANTITOXIN COMMITTEE.—This special committee had its first meeting at 1832 Pine Street, on March 7, 1903, the following members being present: Dr. Theobald Smith, Chairman, Forest Hills, Boston, Mass.; Dr. E. M. Houghton, Detroit, Mich.; Dr. Joseph J. Kinyoun, H. K. Mulford & Co. Lab-

oratories, Glenolden, Pa.; Dr. Wm. H. Park, Department of Health, Borough of Manhattan, New York; Dr. Herbert D. Pease, New York State Department of Health, Albany, N. Y.; Dr. M. J. Rosenau, Director of the Hygienic Laboratory, Marine Hospital Service, Washington, D. C.; Dr. H. A. Hare, 1801 Spruce Street, Philadelphia, Pa.; Surgeon Thomas C. Craig, U. S. N., Brooklyn, N. Y.

"The session lasted eight hours, with one hour's intermission for dinner. The subject of the propriety of introducing diphtheria antitoxin into the United States Pharmacopœia was discussed in all its bearings. Every member of the committee was desirous of seeing diphtheria antitoxin introduced into the next revision, but the difficulties of agreeing upon a suitable test proved to be a question that consumed much time. It was universally conceded that if it were possible to organize a central testing station, either by the Government or under some authority which would be regarded as capable, one of the great difficulties would be removed. But it was pointed out that if such a station was located at Washington, the question of transportation to and fro would be a serious one. Then again, the risks incurred in shipping, through breakage and exposure to high temperature, would also have to be taken into account. The question of having expert official testers visit the laboratories, and place the authoritative seal on the product, was also discussed.

"The bacteriological experts at the meeting expressed their satisfaction at having the opportunity to meet and confer together, and although the question cannot be considered as settled, your Chairman desires to express his satisfaction with the outcome of the meeting at this stage. Each member of the Special Committee was imbued with a desire to give the utmost assistance to our General Committee. It was recognized that some method of standardizing serum products must be devised, so as to prevent the possibility of weak, inefficient, fraudulent or contaminated preparations coming upon the market. The method adopted by the German Pharmacopœia of recognizing the standard of the Königlich preuszische Institut für experimentelle Therapic zu Frankfort a M., and compelling diphtheria antitoxin to be tested by this authority, was conceded to be the best method yet proposed. Erlich's test, or one equivalent to this, is now generally adopted by manufacturers of

diphtheria antitoxin; but it must be remembered that the distances from the manufacturers' laboratories in Germany to the Imperial Institute at Frankfort are trifling as compared with the magnificent distances to be encountered in the United States, so that the question of transportation in this country presents a marked contrast.

"The use of a preservative, whether phenol, tricresol, or some other, was discussed, and it was shown that there was a lack of uniformity among the manufacturers in this respect. The question of deterioration and limitation labels was also discussed. The meeting adjourned, after arranging to meet again on May 12th, in Washington."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

REVUE DES MEDICAMENTS NOUVEAUX et de quelques médications nouvelles. Par C. Crinon, Pharmacien de première classe. Membre de la Société de Pharmacie de Paris et de la Société des Thérapeutique. Directeur du Répertoire de Pharmacie et des Annales de Chimie analytiques. 10e edition, Revue et augmentée. Paris: Rueff et Cie, Editeurs, 106 Boulevard Saint-Germain, 1903.

This, the tenth edition of this popular French handbook on the newer remedies, has just come to hand. From an American point of view the first impression of the book is rather one of disappointment.

This is due to the fact that a number of pages of advertisements are bound in with the book. This is, fortunately, a feature that has not been adopted by the more progressive (?) publishers in this country, and it is to be hoped never will.

Outside of this objectionable feature the book has a number of novel and meritorious points of vantage. It contains upward of 400 closely printed pages and includes practically all of the newer remedies that have been introduced in France. In addition to this, the book also contains a number of titles of drugs and chemicals that, while they cannot be classed among the newer remedies, are not included in the official French standard, the Codex.

Among the newer remedies that have been included in this the tenth edition, we find adrenalin, arrhenal, bismutose, cypridol,

histogenol, hypnopyrine, mesotan, rheumatin, saloquinine and ulmarene.

The general plan has evidently been to give for each preparation, where possible, the mode of preparation, its physical properties and chemical tests where any are known, the most desirable forms of dispensing or administering the remedy followed by its physiologic and therapeutic properties and the dose.

The arrangement of the contained matter is alphabetical, and this is supplemented by a very complete index covering fourteen double-column pages and containing upward of 1,200 references.

The amount of useful and practical information, coupled with the price, which is only 4 francs, should make this book popular with all pharmacists who are conversant with the French language.

M. I. WILBERT.

ANLEITUNG ZUR ERKENNUNG UND PRUFUNG ALLER IM ARZNEIBUCH FUR DAS DEUTSCHE REICH (VEIRTE AUSGABE) AUFGENOMMENEN ARZNEIMITTEL. Von Dr. Max Biechle. Elfte vielvach vermehrte und verbesserte auflage. Verlag von Julius Springer, Berlin, 1902.

The popularity of this interesting little book is evidenced by the fact that this, the eleventh edition, was needed within a year of the publication of the tenth, which was noticed in this JOURNAL for February, 1902, page 85.

The book itself comprises 490 pages, and contains a description and explanations of the uses of all the tests given in the last edition of the German Pharmacopœia. In addition to this it also contains some general directions, a number of tables copied from the Pharmacopœia, a list of reagents and volumetric solutions, a table of the melting and boiling points of a number of substances enumerated in the German Pharmacopœia, also another giving the solubility, in a number of solvents, of the official chemicals. In addition to this we find a résumé of the iodine number of the fatty oils, also the acid, ester and saponification numbers for a number of substances, and a list giving the required fineness of the powder of a number of vegetable drugs, with an indication of the preparations in which they are to be used.

Altogether the contained material has been arranged in such a way that it is not alone readily available for reference, but is particularly valuable for comparison and study. M. I. W.

A GUIDE TO THE PRACTICAL EXAMINATION OF URINE, for the use of physicians and students. By James Tyson. Tenth edition. Revised and corrected, with a colored plate and wood engravings. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1902. Price, $1.50 net.

Tyson's "Guide to the Practical Examination of Urine" is probably better known to pharmacists and physicians than any other analytical work. Other books of merit there are, but Tyson's was the first to appear that presented the subject with conciseness and authority, and while primarily written for the busy physician, has also been utilized by the practising pharmacist in his work as the analyst for the physician. The present work has been carefully revised and some matter expunged. The part treating of the microorganisms found in urine might be enlarged upon as modern pathology would seem to indicate.

A HANDBOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS. Including the physiological action of drugs, the special therapeutics of disease, official and practical pharmacy, and minute directions for prescription-writing. By Samuel O. L. Potter. Ninth edition. Revised and enlarged. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1902. Price, $5 net.

It is only a year since the eighth edition of this handbook was reviewed in this JOURNAL. The following articles have been rewritten: Adrenal Extract, Argentum, Cinchona, Coca, Coffee, Digitalis, Dulcin, Ergot, Ferrum, Ipecacuanha, Myrrha, Saccharinum and Veratrum viride. The new matter includes paragraphs on Actol, Airol, Argentamin, Argentol, Argonin, Chinosol, Creosotal, Dionine, Dormiol, Equinine, Eucaine, Eudoxin, Glycerophosphates, Heroine, Holocaine, Iodomuth, Iodothyrin, Itrol, Largin, Mirvanin, Nosophen, Orphol, Orthoform, Passiflora, Pellotine, Peronine, Phloridzin, Piperidin, Protarzol, Tuberculin-R, Urotropin, Xeroform and Zinc stearite.

In the section on Therapeutics new articles were inserted on Local anesthesia, Beriberi, Dhobic itch, Tropical fevers, Heat stroke, Hemoglobinuric fevers, Lymphadenoma, Miliaria, Bubonic plague, Spine, Tinea imbricata, Tinea versicolor and Toxemia. Thirty-two articles have been rewritten and the text of many articles have been expanded, by the incorporation of more than 300 items from current

medical literature and from the author's personal experience in practice.

This interesting and valuable work is only marred by the author's frequent reference to "the objectional practises of pharmaceutists," which appears to be based on some prejudice rather than on good reason. Dr. Potter says, "many dispensing pharmaceutists are in the habit of making infusions from concentrated alcoholic tinctures or from fluid extracts. It is a very reprehensible practice, especially in those cases where the active ingredients are of a resinous nature, and therefore precipitate when the alcoholic solution is added to water." The infusions he mentions are of cinchona, digitalis, wild cherry and compound senna. None of these drugs contain resins, and, we may add, there are many apothecaries that we know throughout the United States who would not think of making these or other infusions except directly from the drug.

On page 554 Dr. Potter says, "the drug store of the present day has degenerated so much from its legitimate business that ere long physicians will be compelled in self-defense to dispense their own medicines, thereby protecting themselves and their patients from the patent-medicine vending, the counter-prescribing and the many other nefarious methods which have degraded the pharmacist from his old professional position to that of a mere trader in drugs and nostrums." Again, on page 546, Dr. Potter says, "it is doubtless a fact familiar to every observer that the old-time confidential relations between the professions of physician and pharmacist have almost passed into oblivion. In fact, the tendency of pharmacy nowadays is toward the position of mere money-making trade, instead of in the exalted direction of a profession. The indiscriminate renewing of prescriptions, the open sale of quack nostrums and homeopathic pellets, the readiness with which counter-prescribing is indulged in, the insinuations too frequently made over the drug-counter in reflection on physicians, and many other similar practices, have caused the non-combatant profession to regard the average druggist with suspicion." All these statements seem very strange and irrelevant in a text-book, and were they in accord with facts we would admit it to be a lamentable condition of affairs; but it is hard to believe that they can exist in any part of the United States other than in the mind of him who writes, and we cannot help but believe that Dr. Potter is either misinformed or he

has some prejudice against a class of men who are eager to serve the medical profession and who want to live as nearly professional lives as physicians do. We do not think that such insinuations do credit to either the author or the profession which he represents.

OBITUARIES.

PROF. J. J. B. ARGENTI.

Jerome Jean Baptiste Argenti was born in Baltimore in 1861, his father being an Italian and his mother an American. When he was four years old the family removed to San Francisco, where he was educated at St. Mary's College, receiving the degree of B.A. He then entered the pharmacy of Leon Di Nola, where he devoted his spare time chiefly to the study of botany. He afterwards attended the California College of Pharmacy, graduating with honors in 1881. About this time he was made Instructor in Botany in his alma mater, and was employed as pharmacist by W. M. Searby. After a few years he was appointed Instructor in Materia Medica. As he was expert in microscopic work and a skilful photographer, he was appointed Professor of Microscopy, Vegetable Histology and Pharmacognosy, when the College first began to instruct its students in the use of the microscope. On the resignation of Dr. H. H. Behr from the chair of Botany, Professor Argenti was at once chosen, at Dr. Behr's request, to fill the vacancy. Again, in 1897, when Prof. W. M. Searby was called to the chair of Pharmacy in the same College, his work in materia medica was given to Professor Argenti and held by him up to the time of his death. All of these positions he filled very ably, being a patient, painstaking teacher, and having the esteem of his students.

Professor Argenti was a man of unusual natural ability, apparently learning with ease anything to which he applied himself. He was of a modest and retiring disposition; so much so that he was always reluctant to take a prominent part in public. He was active in the affairs of the Alumni Association of the California College of Pharmacy, of the Microscopical Society and of the Camera Club, in all of which he held important offices at various times. In college affairs he was stanch in his advocacy of high standards of entrance and graduation. He passed away in the prime of life, having been engaged in his professional duties only a few days before his death,

which is believed to have been caused by an embolism following a surgical operation. He leaves a wife and two children—both quite young. W. M. SEARBY.

ERNST BILTZ.

Ernst Biltz, a corresponding member of the Philadelphia College of Pharmacy, died at Erfurt, Germany, on January 10, 1903, in his eighty-first year.

From the laudatory expressions of one who knew him, and had come directly under his influence, it would appear that Ernst Biltz was one of those singularly gifted characters that have ideas and ideals far above the wants and needs of their immediate surroundings. Biltz was truly one of the pioneers of modern scientific pharmacy; his rare gifts as a fluent speaker, a skilled experimenter and a facile writer, combined with his originality of thought and genial disposition, made him an actual incorporation of the ideal of the German apotheker. His abilities and efforts have been generally recognized, both at home as well as abroad. In his native city he was repeatedly honored, active as well as honorary offices having been given him from time to time.

On the occasion of his celebrating his fiftieth anniversary as an apothecary, the University of Marburg bestowed on him the honorary degree of Doctor of Philosophy.

Ernst Biltz was a member of a number of scientific societies, among others of the Royal Academy at Erfurt, in which he had the rare honor of being able to celebrate his fiftieth anniversary as a member in 1900. Among other scientific bodies he was elected an honorary member of the Thüringer Botanical Society, the German Pharmaceutical Association and the German Society of Apothecaries.

Ernst Biltz was born in Erfurt, Germany, on July 26, 1822. After attending the local schools he went to Berlin to attend the lectures at the University. In 1847 he became the proprietor of the Grüne Apotheke in Erfurt, succeeding his father, who had received the concession in the early part of the last century.

The life of Ernst Biltz was not alone a long one, it was also a particularly active one up to the time of his death. In addition to taking an active interest in the development of pharmacy along scientific lines, he was also a liberal contributor to various scientific societies on matters pertaining to other branches of natural science, particularly botany.

His widespread and thorough knowledge, his thoroughness in the practice of his profession and his love and devotion for the advancement of scientific truths will insure his name being cherished and held in esteem by the more progressive members of the pharmaceutical profession throughout the world.

M. I. WILBERT.

GEORGE W. SLOAN.

Dr. George W. Sloan, the head of the Sloan Drug Company, of Indianapolis, Ind., died at his home in that city on February 15, 1903. For several years he was a lecturer on Pharmacy in the Indiana Medical College, which institution conferred on him the honorary degree of M.D. Purdue University, in recognition of his services to pharmacy, honored him by conferring on him the title of Doctor of Pharmacy.

Dr. Sloan was born in Harrisburg, Pa., in 1835, from which place his parents removed to Indianapolis in 1837. After attending such schools as that Western city had to offer sixty years ago, young Sloan entered the drug store of his uncle, David Craighead, as an apprentice. In the fall of 1856 he entered as a student in the Philadelphia College of Pharmacy, but only attended one course of lectures.

Dr. Sloan always took a deep interest in matters pertaining to the advancement of pharmacy as a profession. He was elected a member of the American Pharmaceutical Association in 1857, and in 1879 was elected its president. He also served the Association in other official capacities: as a member of important committees, a member of Council, and as local agent for Indianapolis.

Dr. Sloan was also an active member of his State Association, being one of its ex-presidents. For a number of years he was a member of the Indiana State Board of Pharmacy, and at the time of his death was secretary of the same.

Outside of his chosen profession Dr. Sloan took an active interest in public and educational affairs, and was well known to, and highly respected by, the citizens of Indianapolis. M. I. W.

MAHLON K. SMITH.

Mahlon K. Smith, the president of the Smith, Kline & French Company, died at his home in Philadelphia on March 4, 1903.

Mr. Smith was born in Salfordville, Montgomery County, Pa., December 22, 1830. He learned the drug business with his uncle, George K. Smith, and later became associated with him under the firm name of George K. Smith & Co. The firm had extensive business connections throughout the Southern States. During the Civil War this trade was of course entirely cut off, and the firm discontinued in 1862.

Mahlon K. Smith then formed a partnership with George G. Shoemaker. Several years later the firm name was changed to Mahlon K. Smith & Co., and about 1870 was again changed to Smith, Kline & Co. The business of this firm rapidly increased and in 1887 they removed to their large new building, 429–435 Arch Street. The concern was incorporated in 1888 as the Smith, Kline Company.

Several years later, 1891, Mr. French was associated with the company and the title changed to "The Smith, Kline & French Company." Up to within a few weeks of his death Mr. Smith took a keen interest in the affairs of the company and, despite the fact that he had not been actively engaged in the details of the management for several years, it was his practice to spend at least a few hours each day at the office of the company.

M. I. W.

W. NELSON STEM.

W. Nelson Stem, who for four years had acted as registrar at the Philadelphia College of Pharmacy, died suddenly in the library of that institution on the afternoon of Saturday, March 14, 1903.

Mr. Stem was born in Fredericksburg, Va., May 12, 1849. After attending Lafayette College, Easton, Pa., he entered as a student at the Philadelphia College of Pharmacy, graduating in 1873. For many years he was one of the most active members of the Alumni Association, serving successively as one of its directors, vice-presidents and president. He was elected president in 1890. He also served on a number of important committees and for several years was business manager of the *Alumni Report*. He was elected a member of the College in 1889, and in 1899 was elected recording secretary. Several years later he was made secretary to the Board of Trustees. Among other services rendered the College it may be mentioned that in 1899 he was one of a committee appointed to revise the by-laws. A widow and one son survive him.

M. I. W.

GEORGE W. KENNEDY.

George W. Kennedy, a life-member of the Philadelphia College of Pharmacy and one of the best-known members of the American Pharmaceutical Association, died December 22, 1902, at his home in Pottsville, Pa., after an illness of only two days.

Mr. Kennedy was born in Philadelphia, February 22, 1843. After attending rather a limited number of terms in the public schools of his native city he was apprenticed to an apothecary to learn the art and business. At the beginning of the Civil War young Kennedy thought it his duty to join the Army of the North, and on September 15, 1862, he enlisted in Company G, 3d Pennsylvania Reserves. He was wounded on December 13th of the same year and sent to a Government hospital in Philadelphia. During convalescence he found opportunity to attend the lectures at the Philadelphia College of Pharmacy.

He re-enlisted again the following year (1863) and served through the remaining years of the war, being mustered out with his regiment in 1865, having served the last two years as Hospital Steward.

Several years later he found opportunity to re-enter the Philadelphia College of Pharmacy as a student and graduated in 1869. His sense of duty as a pharmacist is well illustrated in the fact that in this same year (1869) he also joined the American Pharmaceutical Association and became a member of this College.

Well equipped and with high ideals, it would be surprising indeed if he had not succeeded in a business way. After graduating from the Philadelphia College of Pharmacy Mr. Kennedy served a short time in a drug store in Pottsville and then opened a store on his own account in Mahanoy City. This he sold later and returned to Pottsville, where he opened the business which has flourished so well.

Mr. Kennedy had ideals above the mere accumulation of wealth; he was always willing and anxious to share the results of his practical experiences with others. This is well illustrated by the numerous papers, of a practical nature, to be found in the files of the AMERICAN JOURNAL OF PHARMACY or the volumes of the "Proceedings of the American Pharmaceutical Association;" these, together, number upward of half a hundred.

Mr. Kennedy was also ready and willing to serve his fellow-pharmacists in an official capacity. This is shown by his service as secretary to the Council of the American Pharmaceutical Association and the Committee on Membership.

In the State Association he was also a leader and one of the foremost workers.

As a member of the State Board of Pharmacy, particularly as its president, he has done much to put the practice of pharmacy in the State of Pennsylvania on a higher professional plane.

As a citizen of the State, or of the city of his choice, it may be said that his integrity and probity were highly appreciated; he was, for several terms, a member of the State Legislature, and was deeply concerned in nearly every educational and philanthropic movement in Pottsville. His connection with these charitable and benevolent institutions made him endeared to his fellow-citizens, who deeply regret his loss.

He leaves a widow and four children. Two of the sons are physicians in the service of the United States.

The appreciation of his work, and his efficiency as an officer of the American Pharmaceutical Association, is well illustrated in the preamble and resolution adopted by the council.

M. I. W.

T. MORRIS PEROT.

T. Morris Perot, a prominent and well-known citizen of Philadelphia, died at his home, 1810 Pine Street, on November 15, 1902, after a long and lingering illness. Of Mr. Perot it may be truly said that he was one of those broad-minded, public-spirited individuals who consider it a duty to take an interest in all that pertains to the advancement or the welfare of their fellow-citizens.

Born in Philadelphia, May 8, 1828, he was the son of the late Francis Perot, a descendant of a French Huguenot family that came to this country about 1685. After the usual preliminary schooling of the early days, young Perot was apprenticed to the drug firm of Jenks & Ogden. He later entered the employ of Chas. Ellis & Co., and was for some time foreman of their laboratory.

The story of this store and laboratory has been recently told by Evan T. Ellis (AMERICAN JOURNAL OF PHARMACY, 1903, page 57).

After leaving Ellis & Co. Mr. Perot engaged in business for himself, being located at 621 Market Street, and doing business under the firm name of T. Morris Perot & Co., until about 1869, when his place of business was destroyed by fire.

Mr. Perot attended the lectures at the College of Pharmacy, and graduated in 1849, writing his inaugural dissertation on chloroform, then a comparatively new drug and one that was attracting considerable attention.

Mr. Perot was elected a member of the Philadelphia College of Pharmacy in 1856, and in 1859 was nominated and elected a member of its Board of Trustees, in which capacity he served uninterruptedly to the time of his death. For more than twenty years he has acted as chairman of the Board.

He was also a life member of the American Pharmaceutical Association, joining at the second meeting in Philadelphia in 1857.

In addition to these associations, that were, of course, more or less closely connected with his business or professional training, Mr. Perot also took a deep interest in the municipality and its citizens. From an early date he was connected with a number of charitable or benevolent institutions. It may be well to mention a few of the institutions with which his name was connected, just to show the catholicity of his philanthropic spirit.

For more than thirty-five years he was president of the Woman's Medical College of Pennsylvania, the oldest institution of its kind in this country if not in the world.

In 1861 Mr. Perot was elected president of the Mercantile Library Company, then situated at Fifth and Library Streets. Under his administration this institution has flourished and has done much to spread knowledge and learning among the inhabitants of the city. For nearly half a century Mr. Perot was the treasurer of the Friends' Charity Fund Association, and of the Northern Soup Society. In addition to these he was connected with the Society to Protect Children from Cruelty, the Society for the Prevention of Cruelty to Animals, and the Maternity Hospital.

Mr. Perot also took an active interest in all attempts to improve local government.

During its existence, he was a member of the celebrated Committee of One Hundred, and later became prominently identified with the Citizens' Municipal Association.

He was also a member of the Union League and the Society of the Sons of the Revolution.

In 1870 Mr. Perot succeeded to his father's business, the Francis

Perot's Sons Malting Company, one of the oldest business houses in this country.

As a business man Mr. Perot was eminently successful, up to within a few years ago, when his health became impaired and his eyesight affected. He was a particularly active man. In addition to his very flourishing malt business he was also interested in the United States Security Life Insurance and Trust Company, as well as a number of manufacturing concerns. Mr. Perot leaves one son, T. Morris Perot, Jr. M. I. W.

PHARMACEUTICAL MEETING.

The regular monthly pharmaceutical meeting of the Philadelphia College of Pharmacy was held Tuesday afternoon, March 24th, the meeting having been postponed for one week on account of the death of the Registrar of the College, W. Nelson Stem. James T. Shinn, the Treasurer of the College, presided.

The first paper on the program was one by Professor Wilbur L. Scoville, of the Massachusetts College of Pharmacy, and was entitled "Standards for Flavoring Extracts." It was read, owing to the absence of the author, by Mr. Freeman P. Stroup (see page 151). In discussing the paper, Prof. C. B. Lowe cited several instances showing how the sense of taste varies in different classes of people, and accorded with the views stated by Professor Scoville. He also emphasized the necessity of keeping vanilla extract some time before using it. Mr. Stroup stated that at one time in his experience he made up a number of grades of vanilla extract, and that the extracts containing tonka bean sold better than those made from vanilla alone.

Herbert J. Watson, of Wilmington, Del., read a paper on "A Modification of Nessler's Tube" (see page 166), and demonstrated the manner of using the apparatus. He also exhibited some paraffin stoppers which are intended for use in bacteriological work, the object being to prevent the evaporation of moisture and to lessen the contamination of cultures with fungi.

Mr. Wilbert said that he had preserved syrup of iodide of iron by covering a cotton plug with melted paraffin. Mr. Stroup asked if paraffin corks would answer this purpose, to which Mr. Watson replied that they were not satisfactory.

M. I. Wilbert, apothecary at the German Hospital, read a paper entitled "Some Notes on Essential Oils" (see page 155). The paper was accompanied by a large number of specimens which were furnished by Messrs. Fritzsche Brothers, of New York, as follows: Oils of peppermint, mustard, clove (artificial), sweet birch, bitter almonds, cassia, cassia (artificial), sandalwood and oil of rose (artificial). Dr. Clemens Kleber, of the Heyden Chemical Works, Garfield, N. J., sent a sample of synthetic oil of wintergreen. Fries Brothers exhibited several of their synthetic products, as follows: Lavendol, rhodinol, cimandrol, etc.

NOTES AND NEWS.

A. B. PRESCOTT, professor of chemistry in the University of Michigan, has recently had conferred upon him the degree of LL.D. by Northwestern University.

AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.—The Proceedings of the third annual meeting, which was held at Philadelphia, September 12–15, 1902, have just been issued. The address of the President, Prof. Joseph P. Remington, is devoted, in the main, to the consideration of the question of securing legislation in the various States whereby Boards of Pharmacy shall require candidates for examination to possess a college diploma. The question was embodied in a resolution which was subsequently adopted by the Conference.

The officers for the ensuing year are: President, Edward Kremers, Madison, Wis.; Vice-President, Henry H. Rusby, New York City; Secretary-Treasurer, Wilbur L. Scoville, Boston. Members of Executive Committee: J. H. Beal, Charles Caspari, Jr., Oscar Oldberg, Lucius E. Sayre and Edsel A. Ruddiman.

THE AMERICAN ELECTRO-CHEMICAL SOCIETY is to hold its third general meeting in New York City on April 16, 17 and 18, 1903. A comprehensive program has been arranged and a large attendance is expected. The meetings will be held in the large assembly hall of the Chemists' Club, 108 West Fifty-fifth Street. By courtesy of the Chemists' Club, its club-house, including the library of the American Chemical Society, will be open for use of members and visitors. By courtesy of the German Liederkranz, its club-house, 111–119 East Fifty-eighth Street, will also be open to members and guests during the convention. Membership buttons will secure admittance.

THE FIFTH INTERNATIONAL CONGRESS OF APPLIED CHEMISTRY will be held in Berlin, beginning May 31st, this being the first time it has been held in Germany. The President of the Congress is Professor Dr. Otto N. Witt, and the work will be done in eleven sections. Dr. H. W. Wiley, U. S. Department of Agriculture, Washington, D. C., is the Chairman of the American Committee of Organization.